

Aug. 27, 1957

R. GIRAUDON

2,804,076

SURGICAL DEVICE FOR PATIENTS UNDERGOING A LARYNGOTOMY

Filed Oct. 1, 1956

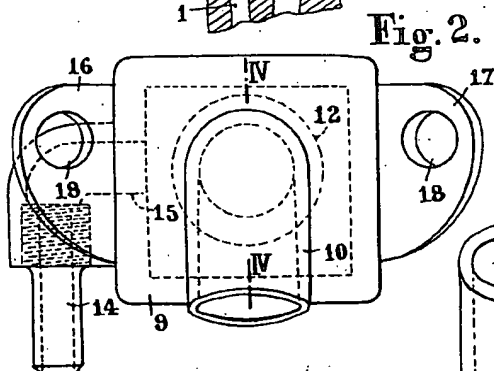
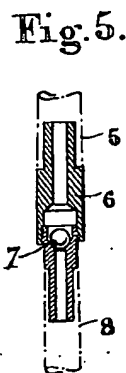
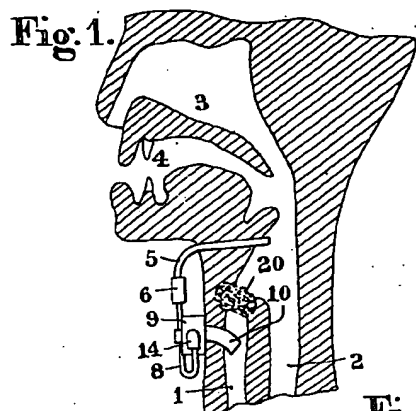


Fig. 3.

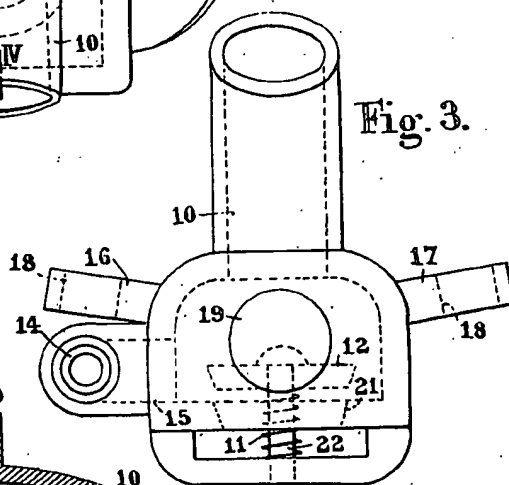
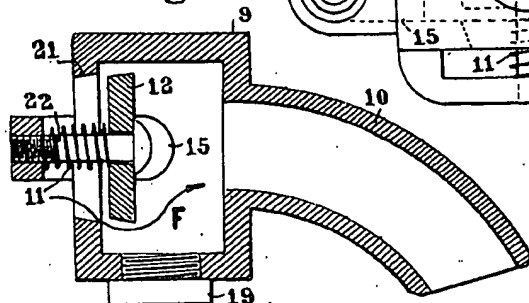


Fig. 4.



INVENTOR  
R. GIRAUDON

BY *Mendelsohn, Lind & Ponce*  
Attys.

1

2,804,076

## SURGICAL DEVICE FOR PATIENTS UNDERGOING A LARYNGOTOMY

René Giraudon, Marseille, France

Application October 1, 1956, Serial No. 613,062

Claims priority, application France October 3, 1955

3 Claims. (Cl. 128—351)

This invention relates to means for assisting patients undergoing the operation of laryngotomy and has particular reference to a surgical device so designed that it will enable the patient to breathe and restore his or her faculty of speech.

It is known that a laryngotomy becomes compulsory when the respiratory tracts are obstructed by a tumor; however, this operation is attended by the loss of the vocal cords so that the patient becomes aphonus for life.

The device according to this invention is of simple and aseptic construction and consists essentially of a valve connected to the cannula inserted into the trachea and of a conduit connected at one end to this valve and at the other end to the back of the throat through the intermediary of a non-return ball-valve; the first valve is normally urged resiliently away from its seat to allow the passage of air therethrough, the ball-valve being closed; the reverse occurs when the patient breathes out air from his or her lungs, thereby restoring the faculty of speech.

A typical embodiment of the device broadly set forth hereinabove will now be described more in detail with reference to the attached diagrammatic drawings forming part of this specification.

In the drawings:

Figure 1 is an elevational view showing the device of this invention fitted in the throat of a patient (shown in section);

Figure 2 is a front view showing the valve from patient's side;

Figure 3 is a plan view from above of the device;

Figure 4 is a section taken upon the line IV—IV of Fig. 2, and

Figure 5 is another section showing the arrangement of the ball-valve provided in the conduit connecting the valve body to the back of the throat.

The operation called laryngotomy becomes compulsory when the trachea 1 is stopped up by a tumor such as 20 which prevents the normal breathing through the nose 3 or mouth 4 of the patient; this operation consists in cutting the trachea below the tumor and introducing a cannula 10 to enable the patient to breathe again; however, this causes the patient to become aphonus.

The device according to this invention comprises a valve body 9 for example of sterilized plastic material, rigid with a curved plastic cannula 10 adapted to be introduced into the trachea 1; the valve member 12 is normally held away from its seat 21 by a spring 11 maintained for example by means of an adjustable screw 22.

This valve may be formed with an integral shank and provided with retaining pins not shown and a compression spring.

When the valve 12 is open the air may flow in the di-

2

rection of the arrow F and penetrate into the patient's lungs through the cannula 10.

The valve body 9 has secured thereon a screw-threaded nozzle 14 formed with left-hand or right-hand threads and leading into the valve body; the flexible pipe 8 is connected to the lower end of this nozzle; the patient's throat is perforated to permit the passage of an aseptic cannula 5 opening into the back of the mouth; these cannulae 5 and 8 are interconnected through a non-return ball-valve 6 in which the ball 7 is normally seated to prevent any passage of air from cannula 5 to cannula 8 and the ingress of mucosities or liquids from the mouth 4 or oesophagus 2 into the valve and trachea.

A pair of lugs 16, 17 may be molded integrally with the valve body 9 and formed with holes 18 for securing thereto a cord (not shown) for attaching the device on the patient's neck.

Finally, a drain plug 19 may be screwed on the bottom of the valve body 9 and a protective case provided in front of the valve with air holes (not shown).

With the apparatus in position as shown in Fig. 1, when the patient breathes out the valve member 12 engages its seat 21 against the resistance of the compression spring 11; air is thus discharged through the hole 15 and nozzle 14, and then through the cannula 8 to unseat the ball 7 and enter the other cannula 5 and the back of the mouth at 4; thus, the patient may articulate and emit sounds.

When the patient stops the utterance of sounds, the spring 11 seats the valve 12 and normal breathing conditions are restored in the direction of the arrow F, while the ball 7 closes the cannula 8.

Of course, many modifications and alterations may be brought to the typical embodiment shown and described herein, without departing from the spirit and scope of the invention as set forth in the appended claims. Thus, any suitable and known valve means may be incorporated in the device, and means other than the aforesaid cord may be used to secure the device on the patient's neck.

What I claim is:

1. A surgical device intended for patients having undergone the operation of laryngotomy, which comprises essentially a valve body of light aseptic material adapted to be fitted on the patient's neck and including a valve, a cannula adapted to be fitted into a passage cut through the wall of the trachea and connected to the aforesaid valve body, a return spring arranged to normally hold said valve in its open position to enable the patient to breath air into the lungs, a nozzle leading through a gaged orifice into the valve body, another cannula adapted to connect said nozzle to the back of the patient's mouth through a passage cut to this end through the patient's neck, and a non-return valve interposed in said other cannula and so arranged as to be closed when the patient breathes in and open when the patient breathes out as said valve is closed simultaneously.

2. A device according to claim 1, comprising means for adjusting the force of the valve spring.

3. A device according to claim 1, wherein said non-return valve comprises a ball-valve and a corresponding seat.

### References Cited in the file of this patent

#### UNITED STATES PATENTS

1,835,757	Burchett	Dec. 8, 1931
2,039,142	Brehm	Apr. 28, 1936